

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (canceled).

1     Claim 2 (currently amended): Apparatus for providing a  
2     web-accessible virtual processing environment to a  
3     network-connected office server for a remotely connected  
4     user computer through which a user stationed at the computer  
5     can execute any of a plurality of server-based applications  
6     resident at the office server, comprising:

7         a platform, capable of being situated in network  
8     communication between the user computer and the office  
9     server, having:

10         a processor;

11         a memory connected to the processor and for  
12     storing computer executable instructions therein;

13         first and second network interfaces, operable in  
14     conjunction with the processor, for interfacing the  
15     platform, through the first network interface, to a wide  
16     area network (WAN) connection through which the remote user  
17     computer obtains connectivity to the platform, and, through  
18     the second network interface, to a local area network (LAN)  
19     having a server computer electrically communicative  
20     thereover, respectively, with the server computer forming  
21     the office server; and

22         wherein, in response to the executable  
23     instructions, the processor, for each one of the  
24     server-based applications:

25                     provides, through a corresponding client  
26 application module implemented on the platform for each of  
27 the server-based applications, bi-directional protocol  
28 conversion of messages between the remote user computer and  
29 the office server, such that user interaction data, intended  
30 for a specific one of the server-based applications and  
31 provided by a browser executing on the remote user computer  
32 in a first protocol, is converted into a second protocol  
33 associated with said one server-based application and then  
34 applied to the server-based application at the office  
35 server, and output data, provided by said specific one  
36 server-based application, is converted from the second  
37 protocol to the first protocol for being transmitted to the  
38 user computer and graphically rendered thereat, through the  
39 browser, to the user; and

40                     wherein, in response to the executable  
41 instructions, the processor:

42 ~~The apparatus in claim 1 wherein the processor, in response~~  
43 ~~to execution of the stored instructions:~~

44                     \_\_\_\_\_for messages emanating from the user computer  
45 and appearing on the WAN connection:

46                     \_\_\_\_\_receives, from the browser, a first  
47 message containing the user interaction data associated with  
48 a specific one server-based application and in the first  
49 protocol;

50                     \_\_\_\_\_converts the user interaction data in  
51 the first protocol to the second protocol associated with  
52 the specific one server-based application to yield a second  
53 message; and

54                     \_\_\_\_\_applies the second message, as input, to  
55 the server computer for processing by the specific one  
56 server-based application; and

57           \_\_\_\_\_for messages emanating from the server  
58 computer and appearing on the LAN:  
59           \_\_\_\_\_receives, from the server computer and  
60 over the LAN connection, a third message containing output  
61 data generated by the specific one server-based application  
62 and in the second protocol;  
63           \_\_\_\_\_converts the output data message in the  
64 second protocol to the first protocol to yield a fourth  
65 message; and  
66           \_\_\_\_\_applies the fourth message to the WAN  
67 connection for transmission to the browser in order to  
68 render the output data thereat.

1    Claim 3 (original): The apparatus in claim 2 wherein the  
2    server computer comprises a corresponding server for each of  
3    the server-based applications and is implemented either  
4    coincident with the platform or as at least one physical  
5    computer separate from the platform and connected, via the  
6    LAN, to it.

1    Claim 4 (previously submitted): Apparatus for providing a  
2    web-accessible virtual processing environment to a  
3    network-connected office server for a remotely connected  
4    user computer through which a user stationed at the computer  
5    can execute any of a plurality of server-based applications  
6    resident at the office server, comprising:

7           a platform, capable of being situated in network  
8    communication between the user computer and the office  
9    server, having:

10                  a processor;  
11                  a memory connected to the processor and for  
12    storing computer executable instructions therein;

13 first and second network interfaces, operable  
14 in conjunction with the processor, for interfacing the  
15 platform, through the first network interface, to a  
16 wide area network (WAN) connection through which the  
17 remote user computer obtains connectivity to the  
18 platform, and, through the second network interface, to  
19 a local area network (LAN) having a server computer  
20 electrically communicative thereover, respectively,  
21 with the server computer forming the office server; and  
22 wherein, in response to the executable instructions,  
23 the processor, for each one of the server-based  
24 applications:

25 provides, through a corresponding client  
26 application module implemented on the platform for  
27 each of the server-based applications,  
28 bi-directional protocol conversion of messages  
29 between the remote user computer and the office  
30 server, such that user interaction data, intended  
31 for a specific one of the server-based  
32 applications and provided by a browser executing  
33 on the remote user computer in a first protocol,  
34 is converted into a second protocol associated  
35 with said one server-based application and then  
36 applied to the server-based application at the  
37 office server, and output data, provided by said  
38 specific one server-based application, is  
39 converted from the second protocol to the first  
40 protocol for being transmitted to the user  
41 computer and graphically rendered thereat, through  
42 the browser, to the user;

43 wherein the processor, in response to execution of the  
44 stored instructions:

45           for messages emanating from the user computer and  
46           appearing on the WAN connection:

47                 receives, from the browser, a first message  
48                 containing the user interaction data associated  
49                 with a specific one server-based application and  
50                 in the first protocol;

51                 converts the user interaction data in the  
52                 first protocol to the second protocol associated  
53                 with the specific one server-based application to  
54                 yield a second message; and

55                 applies the second message, as input, to the  
56                 server computer for processing by the specific one  
57                 server-based application; and

58           for messages emanating from the server computer and  
59           appearing on the LAN:

60                 receives, from the server computer and over  
61                 the LAN connection, a third message containing  
62                 output data generated by the specific one  
63                 server-based application and in the second  
64                 protocol;

65                 converts the output data message in the  
66                 second protocol to the first protocol to yield a  
67                 fourth message; and

68                 applies the fourth message to the WAN  
69                 connection for transmission to the browser in  
70                 order to render the output data thereat;

71           wherein the server computer comprises a corresponding  
72           server for each of the server-based applications and is  
73           implemented either coincident with the platform or as at  
74           least one physical computer separate from the platform and  
75           connected, via the LAN, to it;

76           the apparatus further comprising, in the platform, a  
77       separate corresponding software-implemented application  
78       module for each of the specific server-based applications  
79       for providing protocol translation of the user interaction  
80       data and output data between the first and second protocols;  
81       the application module comprises:

82           a user interaction component communicative,  
83       through the WAN connection, with the browser, for  
84       accepting the user interaction data from the browser in  
85       the first protocol and for providing said output data  
86       to the browser in the first protocol;

87           a state machine, communicative through an  
88       application processing interface with the user  
89       interaction component, for interpreting each command  
90       issued by the user interaction component so as to  
91       provide the user interaction data to the specific one  
92       server-based application executing on the server  
93       computer, and communicative through a client protocol  
94       component, for sending user interaction data to the  
95       server-based application and for receiving said output  
96       information from the specific one server-based  
97       application; and

98           a client protocol component, operative in  
99       conjunction with the state machine, for converting the  
100      user interaction data received from the state machine  
101      into the second protocol and applying resultant  
102      messages in the second protocol to the specific one  
103      server-based application, and for receiving said output  
104      data in the second protocol from the specific one  
105      server-based application and applying said output data  
106      to the state machine.

1 Claim 5 (original): The apparatus in claim 4 wherein the  
2 server-based applications comprise thin-client application  
3 hosting, e-mail and shared file access; and the first  
4 protocol comprises HTTP, secure HTTP, or a protocol with  
5 AIP-like functionality and the second protocol comprises RDP  
6 (remote desktop protocol), IMAP (Internet mail access  
7 protocol) or SMB (server message block).

1 Claim 6 (original): The apparatus in claim 5 wherein the  
2 user interaction data comprises a designation of a uniform  
3 resource locator (URL), uniform resource identifier (URI),  
4 form input, keystrokes or mouse clicks that returns  
5 associated information desired by the user, and output data  
6 comprises graphical display data.

1 Claim 7 (original): The apparatus in claim 6 wherein said  
2 output data comprises bitmap graphic output display data  
3 generated by the specific one server-based application.

1 Claim 8 (original): The apparatus in claim 7 wherein the WAN  
2 connection comprises either a private network connection or  
3 an Internet connection.

1 Claim 9 (original): The apparatus in claim 8 wherein the  
2 second network interface comprises an Ethernet interface,  
3 and the first network interface comprises a broadband  
4 network interface.

1 Claim 10 (original): The apparatus in claim 9 wherein the  
2 broadband network interface comprises a digital subscriber  
3 line (DSL) interface, a cable modem, an integrated services

4 digital network (ISDN) interface, a T1 interface or a  
5 fractional T1 interface.

Claim 11 (canceled).

1 Claim 12 (currently amended): A method for use, in  
2 apparatus, which provides for providing a web-accessible  
3 virtual processing environment to a network-connected office  
4 server for a remotely connected user computer through which  
5 a user stationed at the computer can execute any of a  
6 plurality of server-based applications resident at the  
7 office server, the apparatus comprising a platform, capable  
8 of being situated in network communication between the user  
9 computer and the office server, having: a processor, a  
10 memory connected to the processor and for storing computer  
11 executable instructions therein; first and second network  
12 interfaces, operable in conjunction with the processor, for  
13 interfacing the platform, through the first network  
14 interface, to a wide area network (WAN) connection through  
15 which the remote user computer obtains connectivity to the  
16 platform, and, through the second network interface, to a  
17 local area network (LAN) having a server computer  
18 electrically communicative thereover, respectively, with the  
19 server computer forming the office server; wherein, the  
20 method comprises the steps, performed by the processor, for  
21 each one of the server-based applications:  
22 providing, through a corresponding client application  
23 module implemented on the platform for each of the  
24 server-based applications, bi-directional protocol  
25 conversion of messages between the remote user computer and  
26 the office server, wherein the providing step comprises the  
27 steps of:



28           converting user interaction data, intended for a  
29           specific one of the server-based applications and provided  
30           by a browser executing on the remote user computer from a  
31           first protocol into a second protocol associated with said  
32           one server-based application so as to yield converted user  
33           interaction data;

34           applying the converted user interaction data to  
35           the server-based application at the office server;

36           converting output data, provided by said specific  
37           one server-based application, from the second protocol to  
38           the first protocol so as to yield converted output data; and

39           transmitting the converted output data to the user  
40           computer to be graphically rendered thereat, through the  
41           browser, to the user; and

42           ~~The method in claim 11 further comprising the steps of:~~

43           for messages emanating from the user computer and  
44           appearing on the WAN connection:

45           receiving, from the browser, a first message  
46           containing the user interaction data associated with a  
47           specific one server-based application and in the first  
48           protocol;

49           converting the user interaction data in the first  
50           protocol to the second protocol associated with the specific  
51           one server-based application to yield a second message; and

52           applying the second message, as input, to the  
53           server computer for processing by the specific one  
54           server-based application; and

55           for messages emanating from the server computer and  
56           appearing on the LAN:

57           receiving, from the server computer and over the  
58           LAN connection, a third message containing output data

59 generated by the specific one server-based application and  
60 in the second protocol;

61 converting the output data message in the second  
62 protocol to the first protocol to yield a fourth message;  
63 and

64 applying the fourth message to the WAN connection  
65 for transmission to the browser in order to render the  
66 output data thereat.

1 Claim 13 (previously presented): The method in claim 12  
2 further comprising the step of implementing a corresponding  
3 server for each of the server-based applications either  
4 coincident with the platform or as at least one physical  
5 computer separate from the platform and connected, via the  
6 LAN, to it.

1 Claim 14 (previously presented): A method for use, in  
2 apparatus, which provides for providing a web-accessible  
3 virtual processing environment to a network-connected office  
4 server for a remotely connected user computer through which  
5 a user stationed at the computer can execute any of a  
6 plurality of server-based applications resident at the  
7 office server, the apparatus comprising a platform, capable  
8 of being situated in network communication between the user  
9 computer and the office server, having: a processor, a  
10 memory connected to the processor and for storing computer  
11 executable instructions therein; first and second network  
12 interfaces, operable in conjunction with the processor, for  
13 interfacing the platform, through the first network  
14 interface, to a wide area network (WAN) connection through  
15 which the remote user computer obtains connectivity to the  
16 platform, and, through the second network interface, to a

17 local area network (LAN) having a server computer  
18 electrically communicative thereover, respectively, with the  
19 server computer forming the office server; wherein, the  
20 method comprises the steps, performed by the processor, for  
21 each one of the server-based applications:

22 providing, through a corresponding client  
23 application module implemented on the platform for each  
24 of the server-based applications, bi-directional  
25 protocol conversion of messages between the remote user  
26 computer and the office server, wherein the providing  
27 step comprises the steps of:

28 converting user interaction data, intended for a  
29 specific one of the server-based applications and  
30 provided by a browser executing on the remote user  
31 computer from a first protocol into a second protocol  
32 associated with said one server-based application so as  
33 to yield converted user interaction data;

34 applying the converted user interaction data to  
35 the server-based application at the office server;

36 converting output data, provided by said specific  
37 one server-based application, from the second protocol  
38 to the first protocol so as to yield converted output  
39 data; and

40 transmitting the converted output data to the user  
41 computer to be graphically rendered thereat, through  
42 the browser, to the user; and

43 for messages emanating from the user computer and  
44 appearing on the WAN connection:

45 receiving, from the browser, a first message  
46 containing the user interaction data associated with a  
47 specific one server-based application and in the first  
48 protocol;

49           converting the user interaction data in the first  
50           protocol to the second protocol associated with the  
51           specific one server-based application to yield a second  
52           message; and  
53           applying the second message, as input, to the  
54           server computer for processing by the specific one  
55           server-based application; and  
56           for messages emanating from the server computer and  
57           appearing on the LAN:  
58           receiving, from the server computer and over the  
59           LAN connection, a third message containing output data  
60           generated by the specific one server-based application  
61           and in the second protocol;  
62           converting the output data message in the second  
63           protocol to the first protocol to yield a fourth  
64           message; and  
65           applying the fourth message to the WAN connection  
66           for transmission to the browser in order to render the  
67           output data thereat;  
68           implementing a corresponding server for each of the  
69           server-based applications either coincident with the  
70           platform or as at least one physical computer separate from  
71           the platform and connected, via the LAN, to it; and  
72           providing protocol translation of the user interaction  
73           data and output data between the first and second protocols  
74           through a separate software-implemented application module  
75           for each of the specific server-based applications; wherein  
76           the application module comprises:  
77           a user interaction component communicative,  
78           through the WAN connection, with the browser, for  
79           accepting the user interaction data from the browser in

80           the first protocol and for providing said output data  
81           to the browser in the first protocol;

82           a state machine, communicative through an  
83           application processing interface with the user  
84           interaction component, for interpreting each command  
85           issued by the user interaction component so as to  
86           provide the user interaction data to the specific one  
87           server-based application executing on the server  
88           computer, and communicative through a client protocol  
89           component, for sending user interaction data to the  
90           server-based application and for receiving said output  
91           information from the specific one server-based  
92           application; and

93           a client protocol component, operative in  
94           conjunction with the state machine, for converting the  
95           user interaction data received from the state machine  
96           into the second protocol and applying resultant  
97           messages in the second protocol to the specific one  
98           server-based application, and for receiving said output  
99           data in the second protocol from the specific one  
100          server-based application and applying said output data  
101          to the state machine.

1       Claim 15 (original): The method in claim 14 wherein the  
2       server-based applications comprise thin-client application  
3       hosting, e-mail and shared file access; and the first  
4       protocol comprises HTTP, secure HTTP, or a protocol with  
5       AIP-like functionality and the second protocol comprises RDP  
6       (remote desktop protocol), IMAP (Internet mail access  
7       protocol) or SMB (server message block).

1 Claim 16 (original): The method in claim 15 wherein the user  
2 interaction data comprises a designation of a uniform  
3 resource locator (URL), uniform resource identifier (URI),  
4 form input data, user keystrokes or user mouse clicks that  
5 returns associated information desired by the user, and the  
6 output data comprises graphical display data.

1 Claim 17 (original): The method in claim 16 wherein said  
2 output data comprises bitmap graphic output display data  
3 generated by the specific one server-based application.

1 Claim 18 (original): The method in claim 17 wherein the WAN  
2 connection comprises either a private network connection or  
3 an Internet connection.

1 Claim 19 (original): The method in claim 18 wherein the  
2 second network interface comprises an Ethernet interface,  
3 and the first network interface comprises a broadband  
4 network interface.

1 Claim 20 (original): The method in claim 19 wherein the  
2 broadband network interface comprises a digital subscriber  
3 line (DSL) interface, a cable modem, an integrated services  
4 digital network (ISDN) interface, a T1 interface or a  
5 fractional T1 interface.